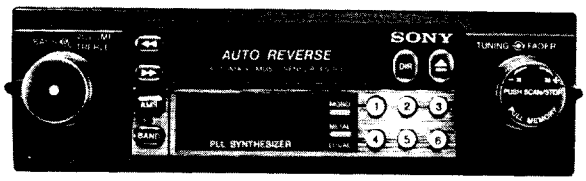
SONY®

FM/AM CASSETTE CAR STEREO

ES-R10

OPERATING INSTRUCTIONS

Before operating this high quality electronic unit, please read this operating manual thoroughly so that you can obtain the maximum enjoyment from it.
This manual should be retained for future reference and used to answer your operational questions as they arise.



OWNER'S RECORD

The model and serial numbers are located on the top of the unit. Record the serial number in the space provided below. Refer to these numbers whenever you call upon your Sony dealer regarding this product.

Model No. ES-R10 Serial No. _____

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INFORMATION

This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

Reorient the receiving antenna

Relocate this equipment with respect to the receiver

Move this equipment away from the receiver

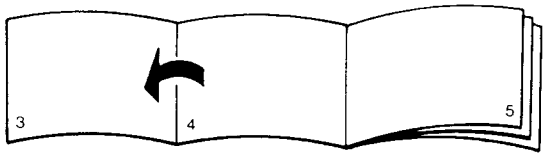
Plug this equipment into a different outlet so that equipment and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems".

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

As you read, fold back this page and refer to the photo on page 3.



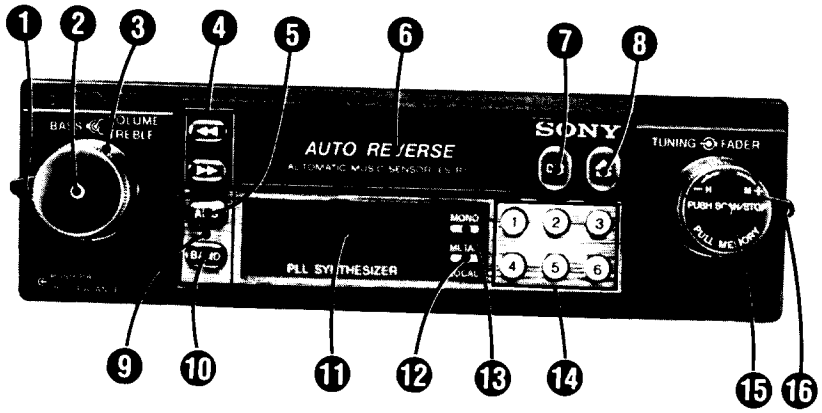

AUTO REVERSE
SONY
TUNING
FADER
PLL SYNTHESIZER
MONO
1
2
3
4
5
6

TABLE OF CONTENTS

Features 4
Precautions 5
Installation 6
Connections 8
Fuse replacement 10
Location and function of controls 11
Tape playback 13
How to operate the AMS function 15
Radio reception 16
Preset tuning 17
How to set the clock 18
Specifications 18

FEATURES

- Cassette car stereo combined with FM stereo/FM-AM tuner.
- The auto-reverse function changes the tape direction automatically.
- Automatic Music Sensor (AMS) function allows to quickly locate the beginning of desired selection.
- The quartz-locked digital synthesizer system with LCD (Liquid Crystal Display) permits easy and accurate tuning to FM and AM stations.
- Up to 12 FM and 6 AM stations can be preset.
- Proper playback characteristics for all types of tapes, including metal cassette.
- The quartz-controlled digital clock.
- The dial scale and the sill of the cassette insertion door illuminate lightly when the car ignition is on, and illuminate more brightly when the set is turned on. Operation under dim light is easy.
- Separate bass and treble control.
- For playback with a 4-speaker system, the fader control is furnished.

PRECAUTIONS

- This unit is designed for negative ground 12 V dc operation only.
- The nameplate indicating operating voltage, etc., is located on the bottom exterior.
- Use speakers with an impedance of 4 to 8 ohms.
- Avoid installing the unit where:
  - It would be subject to high temperatures, such as from direct sunlight or from hot air from the heater.
  - It would be exposed to rain or moisture.
  - It would be subject to dust or dirt.
- If your car was parked in direct sunlight and there has been a considerable rise in temperature inside the car, allow the unit to cool off before operating.
- If no power is being supplied to the unit, check the connections first. If everything is in order, check the fuse. See page 8.
- If no sounds come from the speakers on a 2-speaker system, adjust the fader control to the center position.

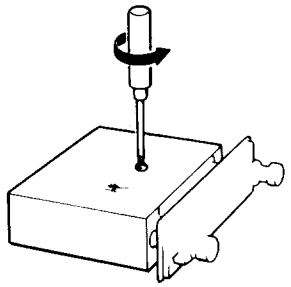
PROTECTION CIRCUIT

This set employs a protection circuit to protect the speakers if the built-in amplifier malfunctions.
When a protection circuit activates, there will be an abrupt loss of sound from the speakers. Particularly when a speaker with a low input impedance (less than 3 ohms) is connected, the sound will be discontinued. This, however, is not a problem. If this happens, turn the volume down a little.

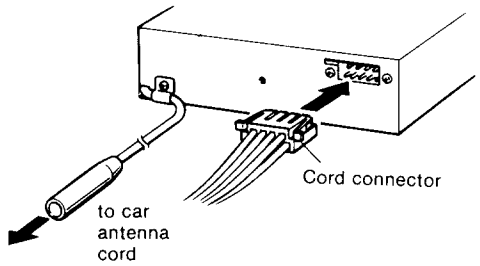
If you have any question or problem concerning your unit that is not covered in this manual, please consult your nearest Sony dealer.

INSTALLATION

Before installing the unit, be sure to remove the lock screw on the top of the unit using a screwdriver.



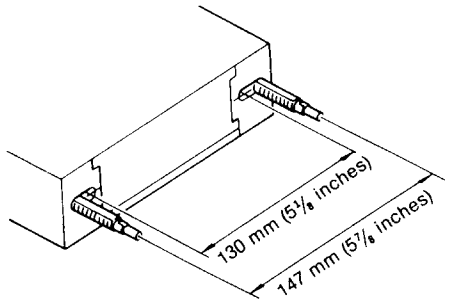
CORD ATTACHMENT



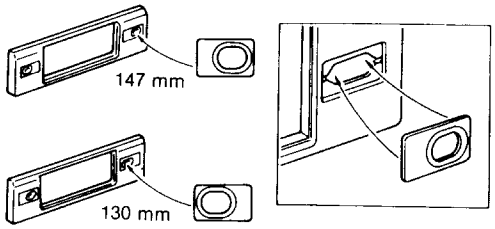
To remove the cord, push in the clips on the connector and pull it out.

ADJUSTMENT OF THE SHAFT SPACING

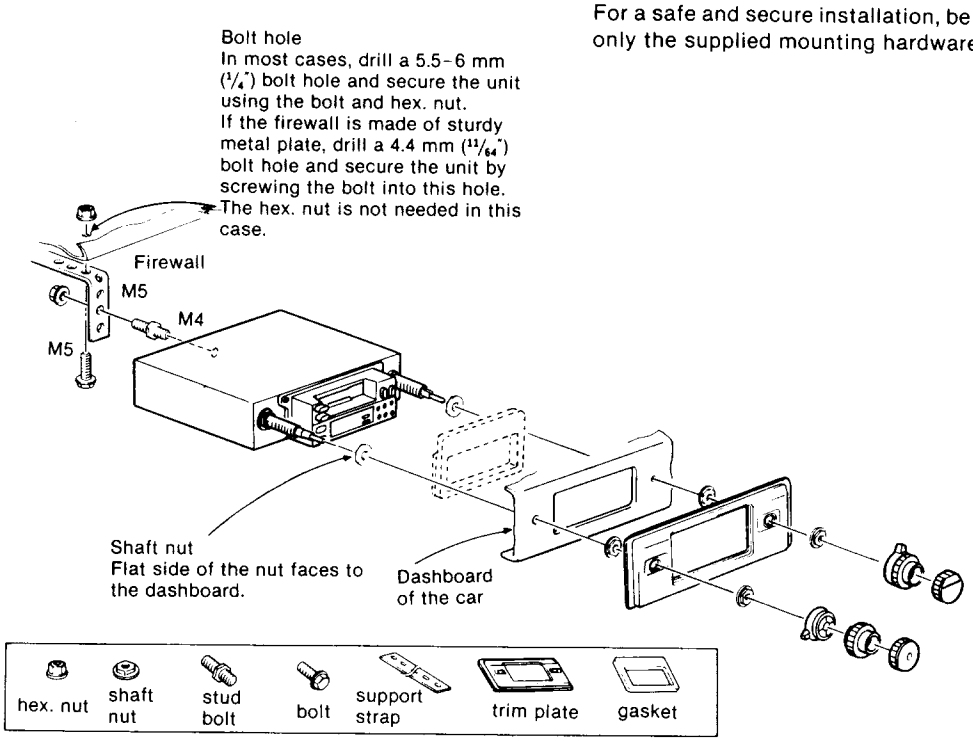
The shaft spacing of the unit is factory-set to 147 mm (5⁷⁄₈"). If the distance between shafts in your car is 130 mm (5¹⁄₈"), adjust the distance by shifting the control shafts.



After adjusting the shaft spacing, fix the cover plate to the trim plate, according to the shaft spacing.



MOUNTING DIAGRAM


Bolt hole
In most cases, drill a 5.5-6 mm (1/4") bolt hole and secure the unit using the bolt and hex. nut.
If the firewall is made of sturdy metal plate, drill a 4.4 mm (11/64") bolt hole and secure the unit by screwing the bolt into this hole. The hex. nut is not needed in this case.
Firewall
M5
M4
M5
Shaft nut
Flat side of the nut faces to the dashboard.
Dashboard of the car
hex. nut
shaft nut
stud bolt
bolt
support strap
trim plate
gasket

Warning

For a safe and secure installation, be sure to always use only the supplied mounting hardware.

CONNECTIONS

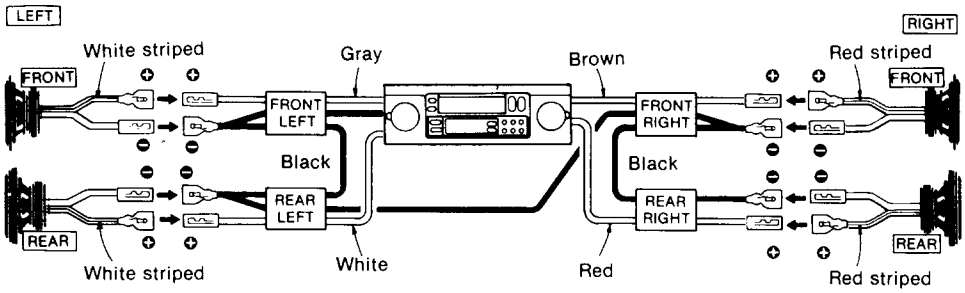
Caution

- Before making connections, disconnect the ground terminal of the car battery to avoid short circuits.
- Connect the red and yellow power input leads only after all other leads have been connected.
- Run all ground wires to a common ground point.

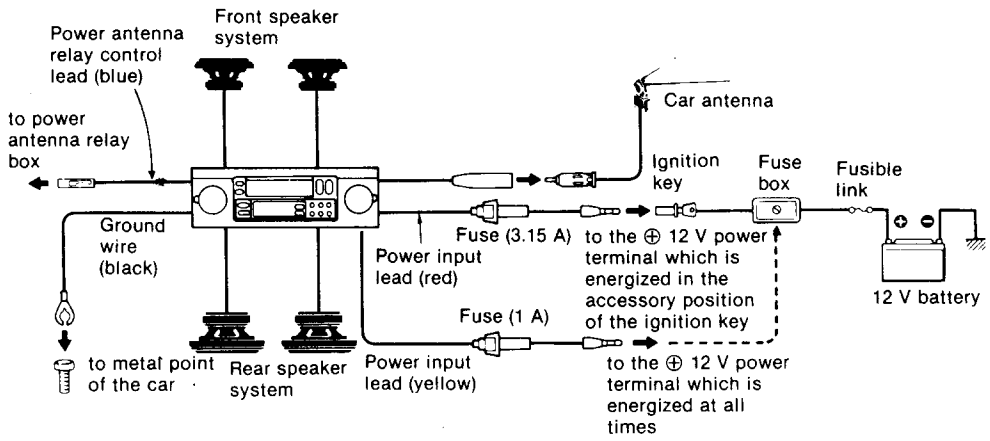
SPEAKER CONNECTION

Caution

- Be sure to use speakers with adequate power handling capacities. If this precaution is not observed, the speakers will be damaged.
- Do not connect the ⊖ terminal of the speaker system with the car chassis.
- Do not attempt to connect the speakers in parallel.



4- OR 2-SPEAKER CONNECTION


Power antenna relay control lead (blue)
Front speaker system
to power antenna relay box
Car antenna
Ignition key
Fuse box
Fusible link
Ground wire (black)
Fuse (3.15 A)
to the ⊕ 12 V power terminal which is energized in the accessory position of the ignition key
Power input lead (red)
12 V battery
Fuse (1 A)
to metal point of the car
Rear speaker system
Power input lead (yellow)
to the ⊕ 12 V power terminal which is energized at all times

To use the unit in a 2-speaker system, use either pair of front speaker cords ($^{\text{FRONT}}_{\text{LEFT}}$ and $^{\text{FRONT}}_{\text{RIGHT}}$) or rear speaker cords ($^{\text{REAR}}_{\text{LEFT}}$ and $^{\text{REAR}}_{\text{RIGHT}}$), and leave the another pair free.

Caution
Be sure to connect the **red** power input lead to the positive 12 V power terminal which is energized when the ignition key is in the accessory position, after all other leads have been connected.

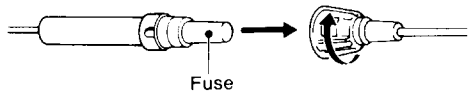
Memory-hold connection
When the yellow power input lead is connected as shown, power will be always supplied to the memory circuit, even when the ignition key is switched off.

POWER ANTENNA CONNECTION
To raise the antenna, push the PUSH RADIO switch to turn on the radio or insert a cassette.
When the radio is turned off and the cassette is ejected, the antenna will automatically retract.
For details about the power antenna, refer to the power antenna instruction manual.

Note: A power antenna without relay box cannot be used with this unit.

FUSE REPLACEMENT

If the fuse blows, check the power connection and replace the fuse. If the fuse blows again after replacement, there may be an internal malfunction. In this case consult your nearest Sony dealer.



Warning
Use a 3.15 ampere fuse for the power input lead and a 1 ampere fuse for the memory circuit. Use of a higher amperage fuse may cause serious damage.

LOCATION AND FUNCTION OF CONTROLS

See the photo on page 3.

❶ BASS control
Turn clockwise for more bass. Center detent for flat response.

❷ VOLUME/PUSH RADIO/PULL BALANCE switch
Turn clockwise for more volume. Press to turn on the radio. To turn off, press it again. While pulling out the control, turn it to adjust the balance of the right and left channels.

❸ TREBLE control
Turn clockwise for more treble. Center detent for flat response.

❹ ▶▶ and ◀◀ (fast forward and rewind) buttons
Depress to rewind or advance the tape rapidly. (See page 14.)
To release the ▶▶ button, press the ◀◀ button lightly. To release the ◀◀ button, press the ▶▶ button lightly.

❺ AMS (Automatic Music Sensor) button
Press to activate the AMS function. The AMS indicator in the display window ⓫ will light up. (See page 15.)

❻ Cassette insertion door

❼ DIR (tape transport direction) button
Press to listen to the other side of the cassette during playback.

❽ EJECT button
Depress to stop tape transport and to take out the cassette.

❾ Position indicator
This indicator illuminates the operation panel for easier operation under dim light.

❿ BAND select button
Press to select the desired band, FM1, FM2 or AM. The corresponding indicator in the display window ⓫ will light up.

⓫ Display window

⓬ LOCAL/METAL button
LOCAL: Depress this button to receive only strong signal stations in FM/AM, or to receive an AM stations at night.
Interference from signals of adjacent stations will be suppressed. The LOCAL indicator in the display window ⓫ will light up.

METAL: When playing back a TYPE II or IV (metal) tape, depress this button so that the METAL indicator in the display window ⓫ will light up. When playing back a TYPE I tape, press this button again to release. The indicator will go off. (See page 13.)

⓭ MONO button

During FM reception, press this button if noise makes it hard to hear the program. The MONO indicator in the display window ⓫ will light up, the reception will be more stable and the noise will be reduced. In this mode, there is no stereo effect.

⓮ Preset buttons

Press the desired button to memorize the frequency and to receive a preset station. (See page 17.)

⓯ PUSH SCAN STOP/manual scan/PULL MEMORY switch and clock adjuster

PUSH SCAN STOP: Push to start automatic scanning and push again to retain the received station in.

Manual scan: Turn this knob to start manual scanning. Turn clockwise to go to a higher frequency, and turn counterclockwise to go to a lower frequency. Keep this knob turned until the frequency of your desired station appears.

PULL MEMORY: Pull out to operate the memory circuit. While the MEM indicator in the display window ⓫ is illuminated, press the desired preset button to memorize the frequency.

Clock adjuster: When you want to set the time digits, operate this adjuster as described "HOW TO SET THE CLOCK" on page 18.

⓰ FADER control

Turn clockwise to increase the volume of the rear speakers, or counterclockwise to increase the volume of the front speakers. Adjust the total volume using the VOLUME control ❷. On a 2-speaker system, set this control to the center position.

TAPE PLAYBACK

As you read, refer to the photo on page 3.

1 Take up any slack in the tape.
2 Push the cassette in with the tape surface to the right, until it snaps into the operating position. Playback will begin.
3 Set the METAL button ⓬ according to the tape being played back. See the TAPE LIST.
4 Adjust the volume with the VOLUME control ❷.

An inserted cassette will begin playback automatically, even if the PUSH RADIO switch ❷ is turned on.

The ▶ indicator shows the playback of the upper side of the cassette and the ◀ indicator the lower side.
To listen to the other side of the cassette, just press the DIR (direction) button ❼.

To stop playback and to take out the cassette, depress the EJECT button ❽.

Note: If the cassette cannot be inserted when the unit is first used, press the EJECT button ❽ once. Then try again.

Caution

- Be sure to take the cassette out when not in use.
- Do not disconnect the power input lead and do not turn off the car ignition with a cassette loaded in the player, or the pinch roller or the tape itself may be damaged.

TAPE LIST

Select the appropriate position for the equalization characteristics of the tape to be used with the METAL button ⓬.

TAPES (C46-C90)	METAL button
SONY: HF, HF-S, HF-ES Other TYPE-I equivalent tapes (for 120 μs and NORMAL BIAS)	TYPE I (released)
SONY: UCX, UCX-S Other TYPE-II equivalent tapes (for 70 μs and HIGH BIAS)	TYPE II, IV METAL (depressed)
SONY: METALLIC, METAL-ES Other TYPE-IV equivalent tapes (for 70 μs and METAL BIAS)	

FAST FORWARD AND REWIND

To rapidly advance the tape
While the ▶ indicator is on, depress the ▶▶ button.
While the ◀ indicator is on, depress the ◀◀ button.

To rewind the tape
While the ▶ indicator is on, depress the ◀◀ button.
While the ◀ indicator is on, depress the ▶▶ button.

When the tape is rewound to the beginning of the tape, the playback of that side will begin.

To resume playback
When the ▶▶ button is depressed, press the ◀◀ button lightly.
When the ◀◀ button is depressed, press the ▶▶ button lightly.

AUTO-REVERSE FUNCTION

This cassette player will automatically play both sides of the cassette in sequence without interruption. As long as the cassette is not removed, it will continue to play, first one side then the other. The transport direction (▶ or ◀) indicator automatically changes at the end of the tape.

CASSETTE CARE

- This unit will automatically reverse the direction of the tape when it senses an entangled tape. If during playback the player should reverse direction a number of times, the tape should be considered damaged. In this case, remove the cassette.
- The use of 120-minute cassette tape is not recommended. Frequent switching of the tape operation mode can result in the tape becoming entangled because this very thin tape can easily be stretched.
- Be sure not to leave cassettes inside your car with the windows closed. Direct sunlight or extremely high temperature will warp cassette shells and cause the tape to stretch.
- Avoid touching the tape surface, as any dirt or dust on the tape will contaminate the heads of the player.
- Store the cassettes in their cases.

CLEANING THE PLAYBACK HEAD

Clean the head every two weeks to enjoy optimum hi-fi stereo sound: use a commercially available cleaning cassette.

HOW TO OPERATE THE AMS FUNCTION

1 While playing back the tape, press the AMS button ❺, so that the AMS indicator lights up.

2 **To start playback from the beginning of the next selection**

While the ▶ indicator is lit, depress the ▶▶ button ❹.
While the ◀ indicator is lit, depress the ◀◀ button.

To repeat the selection being played

While the ▶ indicator is lit, depress the ◀◀ button.
While the ◀ indicator is lit, depress the ▶▶ button.

At the beginning of the selection, the depressed button will be released and playback will begin.

When you depress the ▶▶ or ◀◀ button during a blank space...

Playback will begin from the beginning of the previous selection, or from the beginning of the selection after the next selection.

When the AMS function is not used, release the AMS button ❺ by pressing it again. The indicator will go off.

Notes

- Since the AMS activates by searching out the blank segments on a tape, it may not operate properly in the following situations:
  - —Severe noise or hum exists in the interspace between selections.
  - —An unrecorded segment has an interval of less than 4 seconds.
  - —A selection, such as a classical piece, includes several seconds with no sounds or the performance continues at a low volume for several seconds.
- If you depress the ▶▶ or ◀◀ button ❹ within a space of about 15 seconds after a selection has started to play, playback will begin from the beginning of the previous selection.
- If you depress the ◀◀ or ▶▶ button within about 15 seconds before the end of a selection, playback will begin from the beginning of the selection after the next selection.

RADIO RECEPTION

As you read, refer to the photo on page 3.

AUTOMATIC TUNING

Take out the cassette if present.

1 Push the PUSH RADIO switch ❷.
2 Select the desired band, FM1, FM2 or AM by pressing the BAND select button ⓾. The corresponding indicator will light up.
3 Push the PUSH SCAN STOP button ⓯. When a station is tuned in, scanning stops for a few seconds. When you want to listen to that station, push the button again.
The STEREO indicator will light up when an FM stereo program is tuned in.
4 Adjust the volume with the VOLUME control ❷.

To turn off the radio, press the PUSH RADIO switch ❷ again.

- If noise makes it hard to hear the FM program, press the MONO button ⓭.
- Press the LOCAL button ⓬ to receive AM stations at night or to receive a strong signal station.

MANUAL TUNING

1 Push the PUSH RADIO switch ❷.
2 Select the desired band, FM1, FM2 or AM by pressing the BAND select button ⓾.
3 Observing the frequency digits on the display window, turn and immediately release the manual scan knob ⓯.
Turn the manual scan knob clockwise to go to a higher frequency, and turn counterclockwise to go to a lower frequency. Repeat this step until the desired station is received.
When you turn the manual scan knob ⓯ once, the frequency will be increased or decreased by following intervals.
FM: 200 kHz
AM: 10 kHz

Caution
While driving, keep your eyes on the road and use the automatic tuning or the memory tuning!

PRESET TUNING

As you read, refer to the photo on page 3.

TO MEMORIZE STATION FREQUENCIES

Before presetting, press the PUSH RADIO switch ❷, select the desired band by pressing the BAND select button ⓾, and tune in the desired station by the manual or automatic tuning.

1 Pull out the PULL MEMORY knob ⓯. The MEM (memory standby) indicator in the display window lights for a few seconds.
2 While the MEM indicator is illuminated, press the desired preset button ⓮ to memorize the frequency. The MEM indicator will go off. The order can be chosen for your convenience.

TO RECEIVE A MEMORIZED STATION

1 Push the PUSH RADIO switch ❷.
2 Select the desired band by pressing the BAND select button ⓾.
3 Press the desired preset button ⓮.

You can preset an FM1, an FM2 and an AM station on each button in the desired order.

Notes

- When the MEM indicator is not lit, the memory circuit does not operate to memorize the station.
- The previous memory will be erased when a new frequency is committed to the memory of the same button. An erasure cannot be made without making a new input.

HOW TO SET THE CLOCK

The time digits are displayed in the display window ⓫, except during radio reception.

As you read, refer to the photo on page 3.

1 Make sure that the tuner is set to off.
2 While pulling out the clock adjuster ⓯, turn clockwise to advance the M (minute) digits, and turn counter-clockwise to advance the H (hour) digits. Keep this adjuster turned until the desired time indication appears.

When the cassette player is operating and the tuner is off, the time digits are automatically displayed.
While receiving a radio program, the frequency being received is displayed in MHz for FM reception and in kHz for AM reception.
If you insert a cassette when the tuner is turned on, the display will change automatically from frequency digits into time digits.

SPECIFICATIONS

AUDIO POWER SPECIFICATIONS
POWER OUTPUT AND TOTAL HARMONIC DISTORTION
4 watts per channel minimum continuous average power into 4 ohms, both channels driven from 150-20,000 Hz with no more than 1.5% total harmonic distortion per Car Stereo Ad Hoc committee standards.

OTHER SPECIFICATIONS

Power amplifier section

Outputs	Speaker outputs (sure seal connectors)
Speaker impedance	4-8 ohms
Maximum power output	6 watts per channel at 4 ohms*

*Measured at 14.4 V

Cassette player section

Tape	Prerecorded tape cassette
Tape track	4-track 2-channel stereo
Frequency response	40-14,000 Hz
Signal-to-noise ratio	58 dB with TYPE II, IV cassettes 55 dB with TYPE I cassettes
Wow and flutter	0.15% (WRMS)
Fast winding time	Approx. 1 min. 50 sec. (with C-60)
Crosstalk	Between tracks: better than 50 dB

Tuner section

System	FM/AM superheterodyne tuner Computerized quartz-locked digital synthesizer system
Antenna terminal	External antenna connector Power antenna relay control lead

FM tuner section

Tuning range	87.9-107.9 MHz
Intermediate frequency	10.7 MHz
Usable sensitivity	15 dBf (1.6 μV/75 ohms)
Sensitivity at 50 dB quieting	23 dBf (3.9 μV/75 ohms)
Selectivity	65 dB at 400 kHz
Signal-to-noise ratio	65 dB (stereo), 68 dB (mono)
Harmonic distortion at 1 kHz	0.8% (stereo), 0.5% (mono)
Separation	35 dB at 1 kHz
Frequency response	30-15,000 Hz
Capture ratio	2.0 dB

AM tuner section

Tuning range	530-1,620 kHz (with 10 kHz spacing)
Intermediate frequency	450 kHz
Sensitivity	35 μV

General

Tone controls	Bass ±8 dB at 100 Hz Treble ±8 dB at 10 kHz
Power requirements	12 V dc car battery (negative ground)
Current drain	1.65 A (at maximum power output)
Mounting dimensions	Approx. 178 × 50 × 120 mm (w/h/d) (7 × 2 × 4¾ inches)
Weight	Approx. 1.2 kg (2 lb 11 oz)
Accessories supplied	Mounting hardware (1 set) Spare fuse (3.15 A) (1) Spare fuse (1 A) (1)
Optional accessory	Booster adaptor XA-37

Design and specifications subject to change without notice.